

BUSS 230 - Mid-Term Exam : March 25, 2004

I. Multiple Choice

- 1 b
2 a
3 d
4 a

| | |
|----|---|
| 5 | d |
| 6 | e |
| 7 | c |
| 8 | a |
| 9 | b |
| 10 | d |

- 11 d
12 a
13 c
14 b
15 a

II. True or False

1. FALSE

Business profit is equal to total revenue minus **EXPLICIT** costs.

2. FALSE

The monopoly theory of profit argues that because of restricted entry into an industry, firms can continue to earn profits even in the long-run.

3. FALSE

Total cost is equal to average cost multiplied by output.

4. FALSE

Profit is at a maximum when Marginal Revenue equals Marginal Cost.

5. FALSE

Market demand is obtained as the **HORIZONTAL** summation of individual demand curves.

6. FALSE

% change of **QUANTITY DEMANDED** divided by % change in the **PRICE** of other good.

7. FALSE

The more independent variables, the lower the degree of freedom for a given sample.

8. FALSE

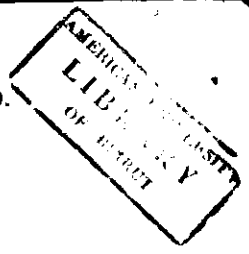
D-W statistic tests for the presence of autocorrelation in the error terms in predicting the dependent variable (Y).

9. TRUE

The trend of time-series data over several years is referred to as the secular trend.

10. FALSE

The use of Leading Indicators is an example of **BAROMETRIC** forecasting methods.



Optimum combination occurs where the two partial derivatives are set at zero.

Taking partial derivatives: $d(P)/d(X) = 144 - 6X - Y = 0$

$d(P)/d(Y) = 116 - 4Y - X = 0$

Solving the two equations simultaneously results in $X = 20$ and $Y = 24$.

III. B At the optimum output combination:

Profits = $144x(20) - 3x(20)^2 - (20)x(24) - 2x(24)^2 + 116x(24) - 35 =$

2797

III. C Solving by adding the LAGRANGIAN function: $L(X + Y - 36)$

$d(P')/d(X) = 144 - 6X - Y + L = 0$

$d(P')/d(Y) = 116 - 4Y - X + L = 0$

$d(P')/d(L) = X + Y - 36 = 0 \implies -108 + 3X + 3Y = 0$

Getting rid of the (L) term first: $28 - 5X + 3Y = 0$

Eliminating (Y) in the above two equations results in $-136 + 8X = 0$

X = 17

Substituting in the constraint \implies **Y = 19**

IV. A The signs of all the coefficients are consistent with theoretical expectations:

Partial $d(Q)/dP < 0 \implies$ Inverse relation between Q and P, as expected.

Partial $d(Q)/dI > 0 \implies$ Consistent with coffee being a normal good.

Partial $d(Q)/dPr > 0 \implies$ Consistent with related good being a coffee substitute.

Partial $d(Q)/dT < 0 \implies$ Consistent with downward trend in coffee consumption.

IV. B At 5% significance level and with 27 Degrees of Freedom, Critical t is 2.052.

Coefficients of P, I, and T exceed critical t, implying they are significantly different from zero. Coefficient for Pr is not significantly different from zero.

IV. C R-square of 0.80 indicates that regression explains 80% of the proportion of the sum squared deviations of the Y-values from the mean Y-value. As such, the regression is a reasonably good fit of the underlying data.

Since R-square = 0.80, SSR = 4 SSE, and since Calculated F-stat = $SSR/(k-1)/SSE/(n-k)$, Calculated F-stat = $4SSE/(k-1)/SSE/(n-k)$

With k = 5, and n-k = 27, Calculated F-stat = 27 which exceeds Critical F of 2.73. Therefore the independent variables taken together explain the behavior of Y.

IV. D Critical D-W values for 4 independent variables and 32 observations are:

$d_L = 1.08$ and $d_U = 1.63$

Since Calculated D-W of 1.85 > d_U , we reject the presence of autocorrelation.

IV. E Forecast for Q in second quarter of 2003 is:

$Q = 2.50 - 0.25X2.00 + 0.50x20.00 + 0.4x1.00 - 0.10x34 =$

9

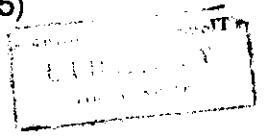
V. A Arc cross elast = $((6500-8000)/0.5*(6500+8000))/((30-35)/0.5*(35+30)) =$

1.345

V. B Arc price elasticity = $-1.5 = ((8000-6500)/0.5*(8000+6500))/((P-25)/0.5*(P+25))$

$-1.5 = ((1500/7250)/((P-25)/(P+25))) \implies -29*(P-25) = 2*(P+25)$

$675 = 31P$, $P =$ **21.7742**



V. C TR before cut = $8000*25 =$ **200,000**

TR after competitor's cut and reaction to that = $8000*21.774 =$

174,194